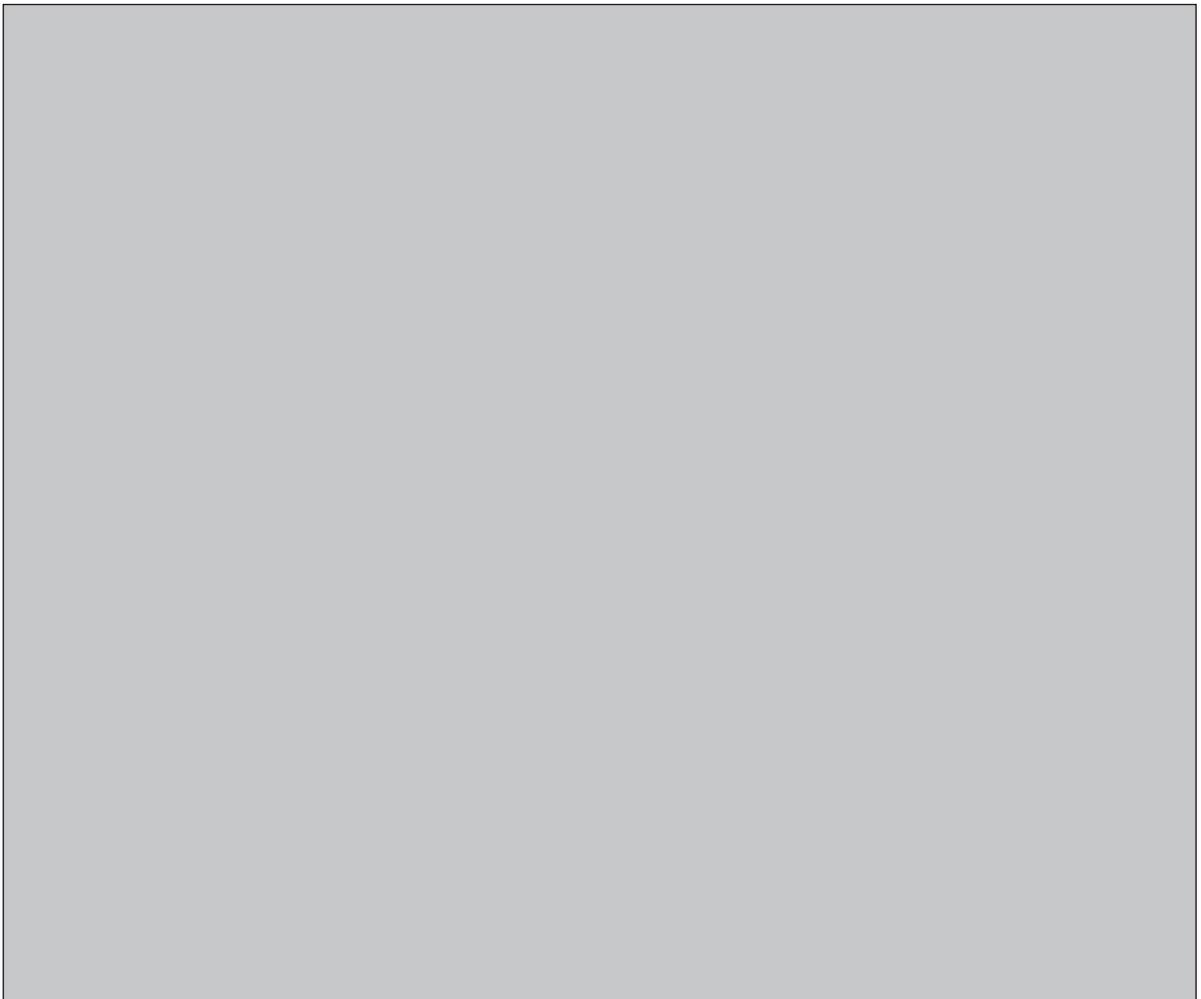


**NWMO BACKGROUND PAPERS**  
**7. INSTITUTIONS AND GOVERNANCE**

**7-9 REVIEW OF THE CNSC LICENSING PROCESS IN RELATION TO  
SPENT FUEL MANAGEMENT**

**EXECUTIVE SUMMARY**

**J.F. Lafortune & F. Lemay**  
**International Safety Research**



---

## EXECUTIVE SUMMARY

---

### INTRODUCTION

The Nuclear Waste Management Organization (NWMO) was established to recommend a long-term approach for managing used nuclear fuel produced by Canada's electricity generators. Its methodology includes public consultation and the commissioning of a number of background papers on the various legislative, social, ethical, technical and economic aspects of long-term fuel management options.

This paper examines the CNSC licensing process that may apply to the preparation, construction and operation of facilities for the long-term management of used nuclear fuel. The CNSC is exclusively responsible for the licensing of nuclear facilities. However, the CNSC licensing process takes into account, when applicable, the results of an environmental assessment. Therefore, this paper also examines how the environmental assessment process is incorporated into the CNSC licensing process.

The aim of this paper is to:

- a. Describe and explain the current regulatory approach for licensing facilities for the long-term management of used nuclear fuel based on existing regulatory requirements and on recent experience with dry-fuel storage at Canadian nuclear power reactor sites; and
- b. Discuss how this approach may apply to the future implementation of a long-term fuel management strategy.

### LEGISLATION AND ROLES

The paper summarizes some of the key legislation that affects the licensing process. Detailed descriptions are contained in other NWMO background documents.

#### **Canadian Nuclear Safety Commission (CNSC)**

The CNSC is responsible for awarding licenses to prepare, construct, operate, decommission and abandon nuclear fuel management facilities. The CNSC is also a Responsible Authority (the organization required to ensure that the assessment is carried out in compliance with the Act) under the Canadian Environmental Assessment Act (CEAA) for proposed nuclear fuel management projects. In past projects, the CNSC has so far been the only Responsible Authority within the federal government. However, this may not necessarily remain the case in future projects on long-term nuclear fuel management.

#### **Canadian Environmental Assessment Agency**

The Agency is responsible for administering the environmental assessment process, providing guidance on, and promoting/monitoring compliance with the CEAA.

## Other federal government departments and agencies

Other federal departments and agencies may play a significant role in the licensing process through their involvement as Responsible or Federal Authorities, which are ministers of the Crown, agencies, departments and departmental corporations of the Government of Canada, or any other body prescribed by regulations, which have a role to play in the environmental assessment).

## Provincial and municipal

The provincial governments are responsible for administering provincial environmental processes and ensuring compliance with applicable provincial legislation regarding proposed fuel management projects. Municipal legislation must also be satisfied.

## Proponents

The generators and owners of spent fuel are the ones responsible for its long-term management. They are therefore proponents.

The Nuclear Waste Management Organization (NWMO) is responsible for investigating approaches for the long-term management of Canada's used nuclear fuel, and for implementing the government's preferred option. The NWMO is therefore the main proponent for the licensing of a long-term fuel management solution. However, it is likely that nuclear utilities will maintain a prominent role as proponents.

## LICENSING PROCESS FOR FUEL MANAGEMENT FACILITIES

The Nuclear Safety and Control Act (NSCA) is the legislation passed by the government of Canada to regulate nuclear practices. According to this Act, nuclear facilities are divided into two categories: Class I and Class II. Class I nuclear facilities have been further subdivided to clarify the distinctions between various operations. Class IA covers facilities such as reactors, while Class IB applies to facilities such as medical isotope producing facilities and uranium processing facilities. Class II facilities, which present lower risks, include accelerators and medical and industrial irradiators.

Nuclear fuel management facilities are considered Class I facilities. Hence, the requirements described in Class I Nuclear Facilities Regulations, articles 3 to 8, apply. These describe the regulatory requirements for obtaining:

- a. a License to Prepare Site;
- b. a License to Construct;
- c. a License to Operate;
- d. a License to Decommission; or
- e. a License to Abandon.

The licensing process for fuel management facilities follows consistent guidelines but it remains flexible and adapted to the requirements and needs of each situation. The process is therefore defined to a certain degree on a case-by-case basis. Any license requires the submission of

licensing documentation that describes, in varying details, the characteristics of the facility, its operation and its impact on the environment. A detailed list of requirements is contained in the regulation for Class I facilities. This report describes each requirement.

To get a license, projects must satisfy the requirements of the Canadian Environmental Assessment Act. In practice, since much of the technical work required for the environmental assessment is also required for the CNSC licensing, this means that the CNSC licensing process for a used fuel storage facility is conducted in parallel with an environmental assessment process. The environmental assessment process requires public consultation and can take considerable time. Therefore, it is in the interest of the proponent to initiate its own program of public consultation and dialogue early.

The CNSC licensing process (as distinct from the environmental assessment process) focuses on the design, engineering and safety aspects of the proposed facility. Public consultation is not required until the final approval stage. The review of this information is internal to the CNSC and is conducted in concert with the proponent. The process is iterative. It involves several meetings between the proponent and the CNSC staff usually instigated by the proponent. It can take considerable time unless there is a common understanding on the part of the proponent and the CNSC staff on requirements and acceptability criteria.

When both the environmental assessment process and the CNSC staff review of the licensing submission have been successfully completed, a recommendation is prepared by the CNSC staff and a CNSC public hearing is held. Following this hearing, assuming that the CNSC agrees with the recommendation of its staff, a license is issued.

The environmental assessment process is described in detail in other NWMO background documents, as referenced in the main report. This report contains a summary of the main steps based on experience gained in the recent review of used fuel storage facility projects.

## **CURRENT EXPERIENCE WITH CANADIAN LICENSING OF NUCLEAR WASTE FACILITIES**

Since the new Acts have been in effect (NSCA and CEAA), several used-fuel management projects have been submitted for licensing, including:

- a. the Darlington Used Fuel Dry Storage site;
- b. the Pickering Waste Management Facility phase II;
- c. the Gentilly-2 modification of the dry radioactive waste and fuel storage facilities;
- d. the Point Lepreau Generating Station (PLGS) Solid Radioactive Waste Management Facility (SRWMF).

Although these projects are quite different from the licensing of a facility for the long-term management of nuclear fuel, the process followed provides some insight on what can be expected for the latter. This report provides a brief description of these projects in terms of process. Two examples are examined in greater detail: one that is still in progress (Gentilly 2) and one that has recently been completed (PLGS).

## RELEVANCE TO THE NWMO MANDATE

Current trends that may affect future implementation of the licensing process for used fuel storage facilities are discussed. They include the following:

- a. There are increased efforts to harmonize the federal and provincial environmental assessment processes. New agreements are expected to be signed, for example with the province of Quebec.
- b. A CNSC/federal working group is in the process of more systematically defining the licensing process for nuclear fuel management facilities.
- c. There is an increasing emphasis on public consultation before the key stages of a project can be approved.
- d. It is likely to remain simpler to modify a license than to obtain a new license for a new site. This process may be further streamlined as discussions are currently taking place within the CNSC to allow a delegated officer to approve environmental assessment guidelines.

The environmental assessment process for long-term fuel management options will probably dominate the overall licensing process even more than it has in recent years. It is likely that it will involve at least a comprehensive study or panel review. The CNSC may not be the only federal Responsible Authority. Several provinces are likely to be involved regardless of the option selected.

For options other than the deep geological disposal of spent nuclear fuel, there are still many technical issues that need to be analyzed and critically reviewed. These include, for example:

- a. Long-term behaviour of fuel storage structures and long-term environmental effects;
- b. For storage on reactor sites, operation of the facility after the nuclear reactor has been decommissioned;
- c. Security; and
- d. For off-site storage, transport of the used nuclear fuel.

The following Table summarizes some of the key safety and environmental assessment features that may have a major impact on the licensing process for the three main options considered by the NWMO.

Option	Safety assessment	Environmental assessment
<b>Storage at nuclear reactor sites</b>	The technical concept has been demonstrated in Canada. It appears acceptable for interim storage. However, safety assessments will need to address the long-term behaviour and safety of structures as well as the long-term operations, maintenance and security aspects.	Some environmental assessments have already been conducted. Screening assessments have been acceptable for interim storage but long-term storage could very well require a comprehensive assessment, review panel or mediation. Studies will also need to reflect results of safety assessment on evaluation of long-term environmental effects.
<b>Centralized storage</b>	The technical concept has not yet been demonstrated in Canada. Transport of the used fuel is likely to be a major concern.	No environmental assessment has yet been performed. Comprehensive assessment, review panel or mediation is most likely to be required.
<b>Deep geological disposal</b>	The concept had been adequately demonstrated from a technical perspective for a conceptual stage of development (Seaborn). A detailed analysis will still be required based on the details of the disposal site and method selected. Transport of the used fuel is likely to be a major concern.	Technical environmental studies have been conducted. However, public concern has not been adequately addressed. Comprehensive assessment, review panel or mediation is most likely to be required.

This report also identifies key factors, based on recent experience, that determine the effectiveness of the licensing process. Most are related to the conduct of the environmental assessment, which, as discussed before, represents the critical path for the approval of the license for a used-fuel storage strategy. These success factors are only some of the elements that should be considered by the NWMO in the planning and implementation of a licensing program for the long-term management of used nuclear fuel. They include:

Key success factors are examined. They include:

- a. Early identification of the need for environmental assessment at every stage of the project;
- b. Harmonized federal and provincial processes;
- c. Positive dialogue between the proponent, federal, provincial and municipal authorities.
- d. Start public consultation and dialogue early.
- e. Establish a tight control over design changes.
- f. Establish a realistic time frame.

## SUMMARY AND CONCLUSION

The licensing process for the long-term management of used nuclear fuel is not yet fully defined and is likely to be determined based on the long-term management option selected. Experience with licensing of fuel management facilities under the new *Nuclear Safety and Control Act* and the revised Canadian *Environmental Assessment Act* is limited, but it provides a basis for the process that could be applied to long-term management options. The licensing process is likely to follow a dual track: the environmental assessment, which is a prerequisite to obtaining a license, and the technical assessment by the CNSC, which eventually leads to the license. The two processes are inseparable, given that the result of the environmental assessment is a key element considered by the CNSC before a license is awarded.